C-4

Annual Report of Operations for Year 2019

To comply with NPDES General Permit No. WAG130000 for Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country within the Boundaries of the State of Washington

NPDES # for your Facility:
WAG130003

Facility & Owner Information

Facility Name: Little White Salmon National Fish Hatchery	
Operator Name (Permittee): Little White Salmon National Fish Hatchery	
Address: 56961 SR 14 Cook, WA 98605	
Email: Bob_Turik@fws.gov	Phone: 509-538-2755
Owner Name (if different from operator):	
Email:	Phone:

Best Management Practices (BMP) Plan

Has the BMP Plan been reviewed this year? ■ Yes ☐ No

Does the BMP Plan fulfill the requirements of the General Permit? ■ Yes ☐ No

Summarize any changes to the BMP Plan since the last annual report. Attach additional pages if necessary.

N/A

ICIS 2/14/2020 JA

EPA General Permit WAG130000 - Annual Report

Operations and Production

Total harvestable weight produced in the past calendar year in pounds (lbs):	145,675
Pounds of food fed to fish during the maximum month:	18,433

List the species grown or held at your facility and the annual production of each in gross harvestable weight. If fish were released rather than harvested, list the weight at time of release.

Species	Fish Produced	Receiving Water(s) to which Fish were Released	Month Released/ Spawned
Sp. Chinook Lot 58	55,986	Little White Salmon River	April Release
Sp. Chinook Lot 60	37,448	Currently Onsite	Spawned '18
Fall Chinook Lot 61	34,946	Little White Salmon River	July release
Fall Chinook 62	17,295	Little White Salmon River	July release

Fill in the table below with production numbers from the past year. List the **maximum** amount of fish on-site and the maximum amount of food fed **per month**.

Month	Total Fish (lbs)	Fish Feed (lbs)	Month	Total Fish (lbs)	Fish Feed (lbs)
January	38,880	2,596	July	71,481	10,519
February	39,577	4,048	August	26,572	5,588
March	60,864	9,687	September	30,538	5,929
April	74,078	7,133	October	36,091	4,979
May	34,261	12,220	November	35,606	2,609
June	58,918	18,433	December	37,488	1,892

Additional Comments:

**Per NPDES instructions, the "harvestable weight" includes weight the lots gained in 2018 also because the fish were released on-site.

These lots were on-site in 2018: 58 and 60.
Sp. Chinook (58) Jan-Dec 2018
Sp. Chinook (60) Aug-Dec 2018
These lots were on-site in 2019: 58, 60, 61, and 62
Sp. Chinook (58) Jan-April 2019
Sp. Chinook (60) Jan-Dec 2019
Fall Chinook (61) Jan-July 2019
Fall Chinook (62) Jan-July 2019

Solid Waste Disposal

Describe the solid waste disposed of during the calendar year (including fish mortalities).

Type of Solid Disposed	Date Disposed	Location Disposed
fish fecal matter	Jan - Dec	earthen pits (onsite)
sediment/organic matter	Jan - Dec	earthen pits (onsite)
fish mortalities	Jan - Dec	earthen pits (onsite)

Additional Comments:

Fecal matter/organics/sediment are flushed to settling basin. Mortalities buried daily.

Fish Mortalities

Include a description and the dates of mass mortalities in the past year (more than 5% per week). Attach additional pages, if necessary. Include total mortalities from all causes.

Date	Cause of Deaths	Steps Taken to Correct Problem	Pounds of Fish
NA	NA	NA	NA

Additional Comments:

Noncompliance Summary

Include a description and the dates of noncompliance events (including spills), the reasons for the incidents, and the steps taken to correct the problems. Attach additional pages, if necessary.
N/A

Inspections & Repairs for Production & Wastewater Treatment Systems

Date Inspected	Date Repaired	Description of System Inspected and/or Repaired

Aquaculture Drugs and Chemicals

Please indicate whether you used each drug/chemical **during the past calendar year**.
Describe the use of each drug/chemical in more detail on the following pages.

Used in the past year?	Drug or Chemical
☐ Yes ☐ No	Azithromycin
☐ Yes ☒ No	Chloramine-T: ***See additional reporting requirements on page 7***
☒ Yes ☐ No	Chlorine Hasa Multi-Chlor
☐ Yes ☒ No	Draxxin
☐ Yes ☒ No	Erythromycin - injectable
☐ Yes ☒ No	Erythromycin - medicated feed
☐ Yes ☒ No	Florfenicol (Aquaflor)
☒ Yes ☐ No	Formalin - 37% formaldehyde: ***See additional reporting requirements on page 7***
☐ Yes ☒ No	Herbicide - describe:
☐ Yes ☒ No	Hormone - describe:
☐ Yes ☒ No	Hydrogen Peroxide: ***See additional reporting requirements on page 7***
☒ Yes ☐ No	Iodine: ***See additional reporting requirements on page 7*** Ovadine
☒ Yes ☐ No	Oxytetracycline Terramycin 200
☐ Yes ☒ No	Potassium Permanganate: ***See additional reporting requirements on page 7***
☐ Yes ☒ No	Romet
☐ Yes ☒ No	SLICE (emamectin benzoate)
☒ Yes ☐ No	Sodium Chloride - salt
☐ Yes ☒ No	Vibrio vaccine
☒ Yes ☐ No	Other: Aqua-des
☒ Yes ☐ No	Other: Virkon Aquatic and Sodium thiosulphate

Aquaculture Drugs and Chemicals (cont'd)

Describe all drug and/or chemical treatments that occurred during the year. Fill out the information below for each drug or chemical, plus page 7 for water-borne treatments. Attach additional pages as necessary.

Brand Name: Aqua-Des		Generic Name: Peracetic Acid	
Reason for use: Disinfectant/Sanitation			
☐ Preventative/Prophylactic ■ As-needed	Total quantity of formulated product per treatment (specify units): 1784 ml	Total quantity of formulated product used in past year (specify units): 1784 ml	
Date(s) of treatment: 8/12/19			Total number of treatments in past year: 1
Maximum daily volume of treated water: 192 Liters	Treatment concentration (specify units): 500 ppm	Duration and frequency of treatment(s): 2 hours/Once	
Method of application:	☐ Static Bath ■ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ■ Incubation building	☐ Ponds ☐ Off-line settling basin	☐ Other (describe):
Where did water treated with this chemical go? (check all that apply):	■ Discharged w/o treatment ■ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Brand Name: Virkon Aquatic		Generic Name: Potassium peroxymonosulfate	
Reason for use: Equipment Disinfectant/Footbath			
☐ Preventative/Prophylactic ■ As-needed	Total quantity of formulated product per treatment: 200 grams (Max)	Total quantity of formulated product used in past year (specify units): 15 kg	
Date(s) of treatment: August-January			Total number of treatments in past year: 75
Maximum daily volume of treated water: 19 Liters	Treatment concentration (specify units): 1% sol-10.5g/L water	Duration and frequency of treatment(s): Footbath bi-weekly/As needed for equip.	
Method of application:	■ Static Bath ☐ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ■ Incubation building	☐ Ponds ☐ Off-line settling basin	■ Other (describe): Lower raceway building
Where did water treated with this chemical go? (check all that apply):	☐ Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works *	■ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use: Discharged onto pavement away from drains and soil			

Aquaculture Drugs and Chemicals (cont'd)

Describe all drug and/or chemical treatments that occurred during the year. Fill out the information below for each drug or chemical, plus page 7 for water-borne treatments. Attach additional pages as necessary.

Brand Name: Hasa Multi-Chlor		Generic Name: Chlorine (sodium hypochlorite)	
Reason for use: Disinfection			
☐ Preventative/Prophylactic ☒ As-needed	Total quantity of formulated product per treatment (specify units): 150 mls (max)	Total quantity of formulated product used in past year (specify units): 3,300 mls	
Date(s) of treatment: April, July, December			Total number of treatments in past year: 5
Maximum daily volume of treated water: N/A	Treatment concentration (specify units): 1.6 ml/L of water	Duration and frequency of treatment(s): One time application per vessel	
Method of application:	☐ Static Bath ☐ Flow-through	☐ Medicated Feed ☒ Other (describe): wand sprayer	
Location in facility chemical was used (check all that apply):	☒ Raceways ☒ Incubation building	☒ Ponds (cement) ☐ Off-line settling basin	☐ Other (describe):
Where did water treated with this chemical go? (check all that apply):	☐ Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☒ Other (describe): See note
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use: Sodium thio applied around closed drain valves in dry vessels as a precaution. Chlorine dries and evaporates at site of application.			

Brand Name: Sodium thiosulphate		Generic Name: Sodium thiosulphate	
Reason for use: Chlorine and iodine neutralizer			
☐ Preventative/Prophylactic ☒ As-needed	Total quantity of formulated product per treatment: 7 grams (max)	Total quantity of formulated product used in past year (specify units): 190 grams	
Date(s) of treatment: May, July-December			Total number of treatments in past year: 60
Maximum daily volume of treated water: 625 Liters	Treatment concentration (specify units): 1.4g/L for Cl- 1.5 g/L for I	Duration and frequency of treatment(s): As needed	
Method of application:	☒ Static Bath ☐ Flow-through	☐ Medicated Feed ☒ Other (describe): In empty vessels	
Location in facility chemical was used (check all that apply):	☒ Raceways ☒ Incubation building	☒ Ponds (cement) ☐ Off-line settling basin	☒ Other (describe): Spawning building
Where did water treated with this chemical go? (check all that apply):	☒ Discharged w/o treatment ☒ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Aquaculture Drugs and Chemicals (cont'd)

Describe all drug and/or chemical treatments that occurred during the year. Fill out the information below for each drug or chemical, plus page 7 for water-borne treatments. Attach additional pages as necessary.

Brand Name: Terramycin 200		Generic Name: Oxytetracycline dihydride	
Reason for use: Control for present disease			
☐ Preventative/Prophylactic ☒ As-needed	Total quantity of formulated product per treatment (specify units): 20 kg (av.)	Total quantity of formulated product used in past year (specify units): 20 kg	
Date(s) of treatment: October			Total number of treatments in past year: 2
Maximum daily volume of treated water: N/A	Treatment concentration (specify units) 3.75kg/ 45.4 kg body weight	Duration and frequency of treatment(s): 10 days on/10days off followed by 10 days on again 10 days of feed per treatment	
Method of application:	☐ Static Bath ☐ Flow-through	☒ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☒ Raceways ☐ Incubation building	☐ Ponds ☐ Off-line settling basin	☐ Other (describe):
Where did water treated with this chemical go? (check all that apply):	☐ Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe): NA
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Brand Name: Parasite -S		Generic Name: Formalin (37% formaldehyde)	
Reason for use: Fungus prevention			
☒ Preventative/Prophylactic ☒ As-needed	Total quantity of formulated product per treatment: 138.8 liters (max)	Total quantity of formulated product used in past year (specify units): 1,972 Liters	
Date(s) of treatment: January, July-December			Total number of treatments in past year: 75
Maximum daily volume of treated water: 831,720 liters	Treatment concentration (specify units): 167 ppm and 1,667 ppm	Duration and frequency of treatment(s): 3x/week for one hour 3x/week for 15 minutes	
Method of application:	☐ Static Bath ☒ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ☒ Incubation building	☒ Ponds ☐ Off-line settling basin	☐ Other (describe):
Where did water treated with this chemical go? (check all that apply):	☒ Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Aquaculture Drugs and Chemicals (cont'd)

Describe all drug and/or chemical treatments that occurred during the year. Fill out the information below for each drug or chemical, plus page 7 for water-borne treatments. Attach additional pages as necessary.

Brand Name: Ovadine		Generic Name: Iodophor (10.7% iodine)	
Reason for use: Disinfection			
☒ Preventative/Prophylactic ☒ As-needed	Total quantity of formulated product per treatment (specify units): 4,682 mls (max)	Total quantity of formulated product used in past year (specify units): 116,608 ml	
Date(s) of treatment: August - November			Total number of treatments in past year: 30
Maximum daily volume of treated water: 625 liters	Treatment concentration (specify units): 75 and 100 ppm	Duration and frequency of treatment(s): One time for 30 minutes for eggs. Solution for equipment disinfection used all day	
Method of application:	☒ Static Bath ☐ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ☒ Incubation building	☐ Ponds ☐ Off-line settling basin	☒ Other (describe): Spawning building
Where did water treated with this chemical go? (check all that apply):	☒ *Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☒ Other (describe): See note**
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use: * Iodine in egg static bath is discharged at a minimum 1:1 ratio ** Vessels containing iodine are neutralized and discharged onto pavement or to settling basin			

Brand Name: American Workman Salt		Generic Name: Sodium Chloride	
Reason for use: saline water for egg fertilization			
☐ Preventative/Prophylactic ☒ As-needed	Total quantity of formulated product per treatment: 7.6 lbs	Total quantity of formulated product used in past year (specify units): 67,393 grams	
Date(s) of treatment: August-November			Total number of treatments in past year: 19
Maximum daily volume of treated water: 2,229 liters	Treatment concentration (specify units): 0.87 kg/95 liters water	Duration and frequency of treatment(s): Solution mixed and used for each spawning day	
Method of application:	☒ Static Bath ☐ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ☐ Incubation building	☐ Ponds ☐ Off-line settling basin	☒ Other (describe): spawning building
Where did water treated with this chemical go? (check all that apply):	☐ Discharged w/o treatment ☒ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Aquaculture Drugs and Chemicals (cont'd)

Describe all drug and/or chemical treatments that occurred during the year. Fill out the information below for each drug or chemical, plus page 7 for water-borne treatments. Attach additional pages as necessary.

Brand Name:		Generic Name:	
Reason for use:			
☐ Preventative/Prophylactic ☐ As-needed	Total quantity of formulated product per treatment (specify units):	Total quantity of formulated product used in past year (specify units):	
Date(s) of treatment:			Total number of treatments in past year:
Maximum daily volume of treated water:	Treatment concentration (specify units):	Duration and frequency of treatment(s):	
Method of application:	☐ Static Bath ☐ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ☐ Incubation building	☐ Ponds ☐ Off-line settling basin	☐ Other (describe):
Where did water treated with this chemical go? (check all that apply):	☐ Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Brand Name:		Generic Name:	
Reason for use:			
☐ Preventative/Prophylactic ☐ As-needed	Total quantity of formulated product per treatment:	Total quantity of formulated product used in past year (specify units):	
Date(s) of treatment:			Total number of treatments in past year:
Maximum daily volume of treated water:	Treatment concentration (specify units):	Duration and frequency of treatment(s):	
Method of application:	☐ Static Bath ☐ Flow-through	☐ Medicated Feed ☐ Other (describe):	
Location in facility chemical was used (check all that apply):	☐ Raceways ☐ Incubation building	☐ Ponds ☐ Off-line settling basin	☐ Other (describe):
Where did water treated with this chemical go? (check all that apply):	☐ Discharged w/o treatment ☐ Settling basin	☐ Septic System ☐ Publicly owned treatment works	☐ Other (describe):
Provide any additional information about how this chemical was used and/or special pollution prevention practices during use:			

Aquaculture Drugs and Chemicals (cont'd)

Additional Reporting Requirements for Water-Borne Treatments

- If a water-borne treatment was used during the calendar year, Permittees must include detailed records/calculations as an attachment to this Annual Report in order to demonstrate how the maximum effluent concentrations of solution and active ingredient were calculated for each chemical.
- EPA recognizes that water-borne treatments may vary in the volume of the vessels treated, concentration, quantity of product, etc. Permittees must provide the information listed in the following tables for a reasonable worst case (i.e., maximum effluent concentration) scenario, not for each individual treatment.
- Permittees must submit this information and calculate the maximum effluent concentration for each water-borne chemical used during the past calendar year.
- See also Appendix D for the Chemical Log Sheet.

Static Bath Treatments	**Ovadine (10.7%)**	
Tank Volume	1891	Liters
Desired Static Bath Treatment Concentration	100,000	µg/L
Volume of Product Needed	14.22	Liters Product
Maximum Effluent Concentration of: 1) Solution and 2) Active Ingredient	Solution: 0.003169mg/L Active Ingredient: 0.0003390 mg/L	Specify Units
Minimum Volume of Total (treated + untreated) Water Discharged from the Facility per day	59,659,363 Liters	Specify Units
Maximum % of Facility Discharge Treated	0.0017	% of Total Discharge

Flow-Through Treatments	**Parasite - S**	
Tank Volume Adult holding ponds	611,646	Liters
Calculated Flow Rate	6,227	Liters/Minute
Duration of Treatment	60	Minutes
Desired Flow-Through Treatment Concentration of Product	167,000	µg/L
Amount of Product to Add Initially	N/A	Liters Product
Amount of Product to Add During Treatment	1,040	mL/Minute
Total Volume of Product Needed	62.4	Liters Product
Maximum Effluent Concentration of: 1) Solution and 2) Active Ingredient	Solution: 1.1 mg/L Active Ingredient: 0.4070 mg/L	Specify Units
Minimum Volume of Total (treated + untreated) Water Discharged from the Facility per day	44,905,503 Liters	Specify Units
Maximum % of Facility Discharge Treated	0.008	% of Total Discharge

Aquaculture Drugs and Chemicals (cont'd)

Additional Reporting Requirements for Water-Borne Treatments

- If a water-borne treatment was used during the calendar year, Permittees must include detailed records/calculations as an attachment to this Annual Report in order to demonstrate how the maximum effluent concentrations of solution and active ingredient were calculated for each chemical.
- EPA recognizes that water-borne treatments may vary in the volume of the vessels treated, concentration, quantity of product, etc. Permittees must provide the information listed in the following tables for a reasonable worst case (i.e., maximum effluent concentration) scenario, not for each individual treatment.
- Permittees must submit this information and calculate the maximum effluent concentration for each water-borne chemical used during the past calendar year.
- See also Appendix D for the Chemical Log Sheet.

Static Bath Treatments	
Tank Volume	Liters
Desired Static Bath Treatment Concentration	µg/L
Volume of Product Needed	Liters Product
Maximum Effluent Concentration of: 1) Solution and 2) Active Ingredient	Solution: Active Ingredient: Specify Units
Minimum Volume of Total (treated + untreated) Water Discharged from the Facility per day	Specify Units
Maximum % of Facility Discharge Treated	% of Total Discharge

Flow-Through Treatments **Parasite - S**	
Tank Volume Nursery stacks	Liters
Calculated Flow Rate	gal/Minute
Duration of Treatment	Minutes
Desired Flow-Through Treatment Concentration of Product	µg/L
Amount of Product to Add Initially	Liters Product
Amount of Product to Add During Treatment	mL/Minute
Total Volume of Product Needed	Liters Product
Maximum Effluent Concentration of: 1) Solution and 2) Active Ingredient	Solution: Active Ingredient: Specify Units
Minimum Volume of Total (treated + untreated) Water Discharged from the Facility per day	Specify Units
Maximum % of Facility Discharge Treated	% of Total Discharge

Aquaculture Drugs and Chemicals (cont'd)

Additional Reporting Requirements for Water-Borne Treatments

- If a water-borne treatment was used during the calendar year, Permittees must include detailed records/calculations as an attachment to this Annual Report in order to demonstrate how the maximum effluent concentrations of solution and active ingredient were calculated for each chemical.
- EPA recognizes that water-borne treatments may vary in the volume of the vessels treated, concentration, quantity of product, etc. Permittees must provide the information listed in the following tables for a reasonable worst case (i.e., maximum effluent concentration) scenario, not for each individual treatment.
- Permittees must submit this information and calculate the maximum effluent concentration for each water-borne chemical used during the past calendar year.
- See also Appendix D for the Chemical Log Sheet.

Static Bath Treatments	
Tank Volume	Liters
Desired Static Bath Treatment Concentration	µg/L
Volume of Product Needed	Liters Product
Maximum Effluent Concentration of: 1) Solution and 2) Active Ingredient	Solution: Active Ingredient: Specify Units
Minimum Volume of Total (treated + untreated) Water Discharged from the Facility per day	Specify Units
Maximum % of Facility Discharge Treated	% of Total Discharge

Flow-Through Treatments	
Tank Volume	Liters
Calculated Flow Rate	Liters/Minute
Duration of Treatment	Minutes
Desired Flow-Through Treatment Concentration of Product	µg/L
Amount of Product to Add Initially	Liters Product
Amount of Product to Add During Treatment	mL/Minute
Total Volume of Product Needed	Liters Product
Maximum Effluent Concentration of: 1) Solution and 2) Active Ingredient	Solution: Active Ingredient: Specify Units
Minimum Volume of Total (treated + untreated) Water Discharged from the Facility per day	Specify Units
Maximum % of Facility Discharge Treated	% of Total Discharge

Changes to the Facility or Operations

Describe any changes to the facility or operations since the last annual report.
The valve for the acclimation pond is stuck in the closed position and will not open. Work is currently being done to solve this issue. Instead of URB going to the acclimation pond before release, fish were transported to other free raceways in our facility and released there.

Signature and Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly evaluate and gather the information submitted. Based on my inquiry of the person or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed name of person signing	Title
Bob Turik	Hatchery Manager
Applicant Signature	Date Signed 1/14/2020

Submittal Information

Send the complete, signed information, along with any attachments, to the following address:

U.S. EPA Region 10, OWW-191

Washington Hatchery Annual Report

1200 Sixth Avenue, Suite 900

Seattle, WA 98101-3140

Iodine (Ovadine) Calculations for Nursery / Spawning (Static Bath)

1) Tank Volume

Heaviest use = 14,226 mls
We use 2136 mls = 75 gal (284L)

$\frac{14,226}{2136} = 6.66$ tubs

(6.66)(284L) = 1891 L

2) Treatment Concentration

100ppm = eggs
100,000 ug/L

3) Volume of product needed

14,226 mls = 14.22 L

4) Max. Effluent Concentration of Solution

Total hatchery flow in October 10,944 gpm = 41428.8 LPM

Total hatchery flow for 24 hrs = 59,657,472 liters

Volume of vessel in gal converted to L
6.66 tubs = 499.5 gal
= 1891 L

Volume of vessel plus total hatchery discharge
1891 L + 59,657,472 L
= 59,659,363 L

Total mg of chemical in effluent

$\frac{(1891)(100ppm)}{59,657,472} =$ 0.003169 mg/L

5) Max Effluent Concentration of Active ingredient

(0.107%)(0.003169 mg/L) = 0.0003390 mg/L

6) Max percent of facility discharge treated

14,226 m/s = 6.666 tubs

6.666 tubs = 284 L

(284L)(6.66) = 1891 L

Hatchery flow in October = 54 gpm

(54)(1891) = 102,114

102,114 / 59,657,472

What % is 102,114 of 59,657,472?

= 0.0017%

Flow-through Formalin (Adult ponds)

1) 2 ponds at 305,823 L each
= 611,646 L

2) 1645 gpm for one pond
Don't multiply by 2 because its same flow rate for chemical concentration
1869 gpm = 6,227 LPM

3) 167 ppm = 167,000 ug/L 60 min treatment

4) 62.4 L = 62,400 mls/min
$\frac{62,400}{60 \text{ min}}$
= 1040 mls/min

5) Total Volume needed = 62.4 L

6) Max effluent concentration of Solution

Hatchery flow in July 8182 gpm = 30,972 LPM

Hatchery flow for 24 hrs = 44,599,680 L

Volume of vessel plus hatchery discharge
305,823 + 44,599,680
= 44,905,503 L

Total mg of chemical in vessel
(167 ppm)(305,823)
= 51,072,441 mg

Total mg of chemical in effluent
$\frac{(305,823)(167 \text{ ppm})}{44,599,680 \text{ L}}$ = 1.1 mg/L

Max. concentration of active Ingredient

(0.37%)(1.1 mg/L) = 0.4070 mg/L

7) Max % of Facility Discharge treated

1 holding pond = 1,645 gpm
≈ 6,227 LPM

(6,227 LPM) (60 min)
= 373,620 L/60 mins

What % is 373,620 of 44,599,650?
= 0.008 %